

ABSTRACT OF THE DISCLOSURE

A trench device with collar oxide for isolation. A buried trench capacitor is formed in a lower portion of a deep trench in a substrate. A conductive layer, surrounded by a collar insulating layer and lower than the collar insulating layer, is deposited in an upper portion of the trench. The collar insulating layer lining the trench is partially removed to expose a portion of the surface of the substrate such that a portion of the conductive layer contacts the substrate. A buried strap is formed where the substrate contacts the conductive layer, as a single-side buried strap. The other portions of the conductive layer are isolated from the substrate by the collar insulating layer. Thus, conventional shallow trench isolation (STI) structure is omitted.